## TECHNICAL NOTES

**Registration**. The reporting of Kansas vital events to the Kansas Department of Health and Environment is mandated by law (K.S.A. 65-102). The filing of birth and death records was begun in 1911 and the registration of marriages and divorces was initiated in 1913 and 1951 respectively. Certificates of births, deaths, fetal deaths, marriages, marriage dissolutions, and reports of abortions are completed by the combined efforts of physicians, hospital personnel, funeral directors, and local courts. All certificates and reports are filed with the Office of Vital Statistics by direct reporting. Since registration of vital events began 83 years ago, over eight million records have been processed, filed and indexed.

**Quality of Data**. The quality of the analyses in the Annual Summary of Vital Statistics depends on the accuracy of the Kansas vital statistics data. The Office of Vital Statistics makes every effort to ensure the completeness and accuracy of the certificates filed. An interchange agreement with all 50 states and Canada ensures that vital events occurring to Kansas residents in other states or Canada are recorded. Tabulation of vital events for 1996 is maintained through March 15, 1997. Reports filed after that date consist of less than one percent of the total reports filed, are considered negligible and are omitted from this report.

**Residence vs Occurrence Data**. Residence data is information compiled according to the usual residence regardless of where the event occurred (including events occurring out-of-state). Occurrence data is information compiled according to the geographical location where the event took place, regardless of the actual residence. Information compiled for births, fetal deaths, deaths and abortions in this report are residence data, while marriages and marriage dissolutions are occurrence data.

**Population**. County population counts for 1994-1996 were obtained from the U.S. Bureau of the Census in unpublished tables. County estimates for 1992 were obtained from the Kansas Division of the Budget-State Demographer and were developed by interpolation from 1990 Census population and year 2,000 projected county population. These county estimates were then adjusted to the total for the State. County estimates for 1993 were based on U.S. Bureau of the Census counts as of July 1, 1992 and then were adjusted to the U.S.C.B. 1993 total for the state.

City population estimates for 1992-1996 were derived as in the following example for 1996:

$$\text{1996 City Population} = \frac{\textbf{City Population, 1995}}{\textbf{County Population, 1995}} \times \text{1996 County Population}$$

Population estimates by age-group and sex were obtained from the State Population and Household Estimates, with Age, Sex,and Components of Change: 1982-89, Series P-25, No. 1058, U.S.C.B. Population counts for 1990 were obtained from the Census of Population, U.S.C.B. Population estimates for 1991-1992 were obtained from the U.S. Bureau of the Census, Press Release CB92-93 and CB92-276, respectively. Population estimates for 1993-1995 were obtained from the Census and You, Vol. 29, No. 4, April 1994, Vol. 30, No. 4, April 1995, Vol. 31, No. 3, March, 1996 and Vol. 32, No. 7, July, 1997 U.S.C.B., respectively. These estimates were used in age-specific and age-adjusted calculations.

Due to rounding and variation in estimation methods within the U.S. Census Bureau, some discrepancies may be found in population data. (Tables 2 and 4) Usually differences are negligible and rarely result in discrepancies in the totals. We advise you to utilize state totals from the county population totals when a total population estimate is needed.

**Derivation of Female Population 10-19**. State estimates of the Kansas female population for 1986-1989 were only available for the 5-14 age-group. In order to estimate the female population 10-14 and 15-19, the 1980 proportion for each of these age groups within the 1980 5-14 age-group had to be derived. These estimates were calculated as in the following example for 1989.

$$\frac{\text{Female Population 10-14 Year Age-Group (1980)}}{\text{Female Population 5-14 Year Age-Group (1980)}} \times \text{1989 5-14 Year Age-Group} = \text{10-14 Year Age-Group (1989)}$$

The same calculation was used for the 15-19 age-group. Once the 10-19 age-group estimates were derived, they were used as denominators for calculating pregnancy rates for females 10-19. Actual population counts for 1990 and population estimates for 1991-1995 were obtained from the U.S. Bureau of the Census.

The 1996 county estimates for females 10-17 were compiled by the Kansas Department of Health and Environment and were adjusted to the U.S.C.B. 1996 total for the state. The 1996 county estimates for females 10-19 were compiled by the U.S. Census Bureau as of 7/1/94. There estimates were then adjusted to the 1996 Census total for the state.

**Deaths**. All causes of death are coded in accordance with the **International Classification of Diseases, Ninth Revision, (ICD-9), 1979,** (World Health Organization). Accuracy of causes of death are dependent on the completeness of the information provided by the physician or coroner concerning immediate and underlying causes of death. The "underlying cause of death" is the cause considered responsible for the sequence of events leading directly to death. The MICAR (Mortality Medical Indexing Classification and Retrieval) computerized

system is used to convert the exact disease terms reported on the death certificate to ICD codes. Once the appropriate codes are tabulated for a death, the codes are analyzed by the Automated Classification of Medical Entities (ACME) system as specified by the National Center for Health Statistics. Subsequently, a final underlying cause of death is assigned to each death.

**Age-adjusted Death Rates.** The direct method for calculating age-adjusted death rates was used in this report. Crude death rates (deaths/total population) are not sensitive to the variety of rates existing in a population. For example, crude death rates are higher among the elderly, but rates are lower in the younger age-groups. Large proportions of the elderly population may increase the crude death rate while death rates for other age-groups remain stable. Age-adjusting death rates eliminates the effects of differences in population composition with respect to age, race, sex, etc. Age-adjusted death rates are useful for comparison purposes and are only valid when compared to rates that were calculated in a similar manner. For this report, age-adjusted death rates were calculated using the U.S. 1940 standard population.

**Years of Potential Life Lost (YPLL)**. The YPLL, for this report, is a measurement of the number of years of potential life lost by each death occurring before the average life expectancy. This calculation provides more information on the societal impact of mortality. Years of life lost counts deaths at a younger age more heavily than those at older ages (e.g., the younger person has a greater potential for years left than an elderly person). YPLL were calculated by subtracting mid-point years of the 5-year age-groups from life expectancies for all Kansans and male and female Kansans as compiled by the Kansas Division of the Budget-State Demographer. The subtraction leaves a remainder - the years of potential life lost, which is then multiplied by the number of deaths in that particular age-group and subsequently all calculations for the five-year age-groups beginning with 0-4 and through over 85 are summed to provide the total years of life lost. In making the calculations, the age-groups with mid-points larger than the life expectancy were set to zero because they would not contribute years of life lost (e.g., they are over the life expectancy). For this report, the life expectancy for all Kansans is 77.11 years, males 73.61 and females 80.51 years.

**Rate Reliability**. Vital statistics are easily influenced by random variation and single-year rates can fluctuate from year to year. A multiple-year rate such as a five- or ten- year average of single-year rates would be more accurate in formulating conclusions on vital events. For example, although the infant death rate for Kansas was 9.2 in 1987 and 8.2 in 1996, the 1987-1996 ten-year infant death rate for Kansas was 8.4 infant deaths per 1,000 live births. A five or ten-year rate smooths some of the variation in single-year rates and would be a more reliable indicator of infant death rates in Kansas.

Rates based on a small or large number of events in a sparsely populated area can vary widely. To exemplify the variation that may occur with a small number of events, in 1996, Wallace county was one of the least populated counties in Kansas with 1,812 residents and Sedgwick county was the largest with 422,437 residents. With 18 deaths occurring in Wallace county in 1996, the crude death rate would be 9.9 deaths per 1,000 population, whereas, 3,442 deaths occurring in Sedgwick county represents a crude death rate of 8.1 deaths per 1,000 population. If five more deaths occurred in each county (e.g., multiple-death accident) Wallace county's crude death rate would increase to 12.7 deaths per 1,000 population. Sedgwick county's crude death rate would increase by only a few hundredths and with rounding, still remain 8.1 deaths per 1,000 population. Therefore, one must use caution when comparing rates of vital events between counties of extreme population size differences to avoid misleading conclusions.

**Limitations of Pregnancy Outcome Data**. Prior to 1994, all births occurring at Irwin Army Hospital to Ft. Riley residents were recorded for Geary county even when Riley was the county of residence. Beginning in 1994, these births are recorded to the appropriate county of residence.

Teenage pregnancy data is the sum of live births, reported abortions and fetal deaths. From July,1970 through June,1995, only hospitals in Kansas were required by K.S.A. 65-445 to keep and submit to the Secretary of the Department of Health and Environment, written records of all pregnancies terminated in the hospital. During this reporting period, nonhospital providers were required to report terminations only on a voluntary basis. Although Kansas has a comprehensive coverage of providers, there could be a small number of abortions not reported. This means that the data may be, to a certain degree, underreported. However, effective July 1, 1995, the Kansas legislature amended K.S.A. 65-445 in Senate Bill 384 to broaden the record-keeping and reporting requirement to include every medical care facility and every person licensed to practice medicine and surgery.

**Handling of Unknowns**. Items for which no response was provided are shown as "not stated" in the tables and graphs throughout this publication. To ensure the accuracy of the data, the "not stated" have been removed from totals when calculating percentages.

## DEFINITIONS

The following terms, formulas and symbols are defined for more meaningful interpretations of the data contained in this report.

| | |
|---|---|
| Abortion: (induced termination of pregnancy): | The purposeful interruption of pregnancy with the intention other than to produce a live born infant or to remove a dead fetus and which does not result in a live birth. |
| Annulment: | The invalidation of a marriage contract. |
| Birth Weight: | The weight of the fetus or infant at the time of delivery. |
| Cause of Death: | The underlying cause of death, or that condition giving rise to the chain of events leading to death. |
| Congenital Anomalies: | Defects existing at and usually before birth regardless of causation. |
| Divorce: | The dissolution of a legally binding marriage contract. |
| Fetal Death: | Any complete expulsion or extraction from its mother of a product of human conception the weight of which is in excess of 350 grams, irrespective of the duration of pregnancy, resulting in other than a live birth, and which is not an induced termination of pregnancy. |
| Gestation: | The period of time between the last reported normal menses and the delivery of the fetus or infant. |
| Hebdomadal Death: | The death of a liveborn infant which occurs prior to the seventh day of life. |
| I.C.D. Code: | The cause-identifying number classified in the Ninth Revision of the International Classification of Diseases adopted in 1979. |
| Infant Death: | The death of a liveborn infant which occurs within the first year of life. |

## DEFINITIONS (Cont.)

| | |
|---|---|
| Legal Intervention: | Includes legal execution and injuries inflicted by the police or other law-enforcing agents, including military on duty in the course of arresting or attempting to arrest law breakers, suppressing disturbances, maintaining order and other legal action. |
| Live Birth: | The complete expulsion or extraction of a product of human conception from its mother, irrespective of the duration of pregnancy, that, after such expulsion or extraction, shows any evidence of life such as breathing, heartbeat, pulsation of the umbilical cord, or voluntary muscle movement, whether or not the umbilical cord has been cut or the placenta attached. |
| Low Birth Weight: | Weight of a fetus or infant at delivery which is under 2,500 grams (less than five pounds, 8 ounces). |
| Marriage: | The legal union of a male and female. |
| Marriage Dissolution: | A marriage dissolved by either a divorce or an annulment. |
| Maternal Death: | The death of a mother caused by complications of pregnancy, childbirth or the puerperium. |
| Natural Increase: | Live births minus total deaths of a population within a given year. |
| Neonatal Death: | The death of a liveborn infant which occurs prior to the twenty-eighth day of life. |
| Occurrence Data: | Vital statistics compiled on the basis of where the vital event happened. |
| Out-of-Wedlock Birth: | A birth occurring to a mother who is not married at the time of conception or at the time of birth or at any time between conception and birth. |
| Perinatal Period III Death: | The aggregate total of fetal deaths (fetus weighs over 350 grams) and hebdomadal deaths (deaths that occur prior to the 7th day of life). |
| Population Density: | The average number of inhabitants per square mile. |
| Prenatal Care: | Medical care during pregnancy before birth. |
| Puerperium: | Period of time after delivery, usually six to eight weeks during which all maternal reproductive organs return to the normal pre-pregnancy condition. |

## DEFINITIONS (Cont.)

| | |
|---|---|
| Residence Data: | Vital statistics compiled on the basis of the usual place of residence of the person(s) to whom the vital event occurred. |
| Teenage Pregnancy: | A live birth, fetal death or abortion occurring to a female under 20 years of age. |
| Total Births: | All live births plus fetal deaths. |
| Trimester: | A three-month period of time. First trimester care, for example, refers to care initiated in the first three months of pregnancy. |
| Very Low Birth Weight: | Weight of a fetus or infant at delivery which is under 1,500 grams (less than 3 pounds, 5 ounces). |

# RATES AND RATIOS

| | | |
|---|---|---|
| Abortion Ratio: | $\frac{\text{induced abortions}}{\text{live births}}$ | x 1,000 |
| Age-Adjusted Death Rate: | $\frac{\sum M_a \quad P_a}{P}$ | x 1,000 |

Where $M_a$ = age-specific death rate per 1,000 population for a given age-group
$P_a$ = standard population in a given age-group
$P$ = total standard population

| | | |
|---|---|---|
| Age-Specific Death Rate: | $\frac{\text{deaths in a specific age-group}}{\text{population in a specific age-group}}$ | x 1,000 |
| Age-Specific Fertility Rate: | $\frac{\text{live births in a specific age-group}}{\text{female population in a specific age-group}}$ | x 1,000 |
| Birth Rate: | $\frac{\text{live births}}{\text{total population}}$ | x 1,000 |
| Cause-Specific Death Rate: | $\frac{\text{cause-specific deaths}}{\text{total population}}$ | x 100,000 |
| Death Rate: | $\frac{\text{total deaths}}{\text{total population}}$ | x 1,000 |
| Divorce Rate: | $\frac{\text{divorces}}{\text{total population}}$ | x 1,000 |
| Marriage Dissolution Rate: | $\frac{\text{divorces and annulments}}{\text{total population}}$ | x 1,000 |
| Fertility Rate: | $\frac{\text{live births}}{\text{female population 15-44}}$ | x 1,000 |
| Fetal Death Rate: | $\frac{\text{fetal deaths}}{\text{total births}}$ | x 1,000 |
| Hebdomadal Death Rate: | $\frac{\text{hebdomadal deaths}}{\text{live births}}$ | x 1,000 |
| Infant Death Rate: | $\frac{\text{infant deaths}}{\text{live births}}$ | x 1,000 |
| Marriage Rate: | $\frac{\text{marriages}}{\text{total population}}$ | x 1,000 |

## RATES AND RATIOS (Cont.)

| | | |
|---|---|---|
| Maternal Death Rate: | maternal deaths / live births | x 10,000 |
| Natural Increase Rate: | live birth rate minus total death rate | |
| Neonatal Death Rate: | neonatal deaths / live births | x 1,000 |
| Out-of-Wedlock Birth Ratio: | out-of-wedlock births / live births | x 100 |
| Perinatal Period III Death Rate: | perinatal period III deaths / total births | x 1,000 |
| Teenage Pregnancy Rate: | live births, fetal deaths, abortions for females in a specific age-group / female population in a specific age-group | x 1,000 |
| Years of Potential Life Lost Rate | years of Potential Life Lost / population | x 1,000 |

## SYMBOLS AND ABBREVIATIONS

| | |
|---|---|
| n.s. | not stated |
| n.a. | not available |
| n/a | not applicable |
| - | zero |
| 0.0 | quantity or percent more than zero but less than 0.05. |

This Report Was Prepared By:

Center for Health and Environmental Statistics
Lorne A. Phillips, Ph.D., Director and State Registrar

Office of Health Care Information
Elizabeth W. Saadi, Ph.D., Director

Author: Karen Sommer, M.A.

Editors: Charles Crevoiserat, M.P.A.
Alicia Tetuan

Data For This Report Were Collected By:

Office of Vital Statistics
Charlene Satzler, Director

Kansas Department of Health and Environment
Landon State Office Building
900 S.W. Jackson
Topeka, Kansas 66612-1290

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